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L7: Entry 128 of 382

File: USPT

Feb 13, 2001

DOCUMENT-IDENTIFIER: US 6189030 B1

TITLE: Method and apparatus for redirection of server external hyper-link references

Brief Summary Paragraph Right (2):

The present invention is generally related to the control of network information server systems supporting World Wide Web based data pages and, in particular, to a server system and process for efficiently redirecting external server hyper-link references for purposes of controlling, moderating, and accounting for such references.

Brief Summary Paragraph Right (4):

The recent substantial growth and use of the internationally connected network generally known as the Internet has largely been due to widespread support of the hypertext transfer protocol (HTTP). This protocol permits client systems connected through Internet Service Providers (ISPs) to access independent and geographically scattered server systems also connected to the Internet. Client side browsers, such as Netscape Mozilla.RTM. and Navigator.RTM. (Netscape Communications Corp.), Microsoft Internet Explorer.RTM. and NCSA Mosaic.TM., provide efficient graphical user interface based client applications that implement the client side portion of the HTTP protocol.

Brief Summary Paragraph Right (6):

The distributed system of communication and information transfer made possible by the HTTP protocol is commonly known as the World Wide Web (WWW or W3) or as simply "the Web." From a client side user interface perspective, a system of uniform resource locators (URLs) is used to direct the operation of a web browser in establishing atomic transactional communication sessions with designated web server computer systems. In general, each URL is of the basic form:

Brief Summary Paragraph Right (7):

Specification by user selection of a URL on the client side results in a transaction being established in which the client sends the server an HTTP message referencing a default or explicitly named data file constructed in accordance with the hypertext mark up language (HTML). This data file or web page is returned in one or more response phase HTTP messages by the server, generally for display by the client browser. Additional embedded image references may be identified in the returned web page resulting in the client browser initiating subsequent HTML transactions to retrieve typically embedded graphics files. A fully reconstructed web page image is then presented by the browser through the browser's graphical user interface.

Brief Summary Paragraph Right (8):

Due to the completely distributed client/server architecture of the Web, as made possible by the URL system further supported by the existing Internet name resolution services and routing conventions, HTTP servers can be independently established with little difficulty. Consequently, the Web has no centrally or even regionally enforced organization other than loosely by name of the top level domain. Searching for information or other resources provided by individual HTTP servers is therefore problematic almost by definition. Because of the time, cost and complexity of assembling comprehensive, yet efficiently searchable databases of web information and resources, commercial Internet Business Services (IBS) have been established to provide typically fee based or advertising revenue supported search engine services that operate against compilations of the information and resources available via the Web correlated to source URLs. Access to such search engines is usually provided

through server local web pages served by the Internet Business Services. The results of a search are served in the form of local web pages with appropriate embedded remote or hyper-linked URLs dynamically constructed by the server of the Internet Business Service.

Brief Summary Paragraph Right (9):

Because of the opportunity presented by the likely repeated client access and retrieval of search engine and search result web pages, providers of other Internet based services have begun to actively place advertisements on these web pages. As is typical in advertising mediums, the frequency of display of an advertisement generally defines the compensation paid to the advertisement publisher. Thus, the number of times that an advertisement is simply transferred to a client browser provides an indication of how effectively the advertisement is being published. A more direct measure of the effectiveness of a particular advertisement on a particular web page is the number of times a client web browser chooses to actively pursue the URL represented by the advertisement. Thus, there is a need to be able to track information obtainable from a client browser when a hyper-linked advertiser's URL is selected.

Brief Summary Paragraph Right (10):

The difficulty in obtaining direct reference information arises from the fact that a web page with an embedded advertisement and corresponding remote URL is served in its entirety to the client browser upon first reference to the web page. The selection of a particular advertiser's URL is then by definition performed through an independent transaction directed to the HTTPd server associated with the advertiser. Since the advertiser publishing HTTPd server is not part of this subsequent transaction, the publishing server is conventionally incapable of tracking client browser hyper-links actually executed to an advertiser's URL or any other URLs embedded in a web page previously served to the client browser.

Brief Summary Paragraph Right (11):

Simple web page access counters are relatively well known and used throughout the Web. These access counters are based on a common gateway interface (CGI) facility supported by modern HTTPd server systems. The CGI facility permits generally small programs, at least typically in terms of function, to be executed by a server in response to a client URL request. That is, the HTML web page definition provides for the embedding of a specific HTML reference that will specify execution of a server side CGI program as part of the process of the web browser reconstructing an image of a served web page. Such a HTML reference is typically of the form:

Brief Summary Paragraph Right (12):

Access counters, however, fundamentally log only server local web page accesses. The client browser to the CGI program is evaluated by the client in connection with the initial serving of the web page to the client browser. The initial serving of the web page to the client browser can be connected, but any subsequent selection of a URL that provides a hyper-link reference to an external server is not observed and therefore is not counted by a CGI program based access counter. Other limitations of access counters arise from the fact that the implementing CGI program is an independently loadable executable. The CGI program must be discretely loaded and executed by the server computer system in response to each URL reference to the CGI program. The repeated program loading and execution overhead, though potentially small for each individual invocation of the CGI program, can represent a significant if not substantial load to the sever computer system. The frequent execution of CGI programs is commonly associated with a degradation of the effective average access time of the HTTPd server in responding to client URL requests. Since an Internet Business Service providing access to a search engine logs millions of requests each day, even small reductions in the efficiency of serving web pages can seriously degrade the cost efficiency of the Internet Business Service. As of December, 1995, Infoseek Corporation, in particular, handles an average of five million retrievals a day.

Brief Summary Paragraph Right (14):

In addition, external CGI programs present a significant problem in terms of maintenance, including initial and ongoing server configuration and control, and security in the context of a busy server system. Individual CGI programs will likely be needed for each independent web page in order to separately identify web page

service counts. Alternatively, a CGI program can be made sufficiently complex to be able to distinguish the precise manner in which the program is called so as to identify a particular web page and log an appropriately distinctive access count. Maintenance of such CGI programs on a server system where large numbers of page accesses are being separately counted is non trivial.

Brief Summary Paragraph Right (15):

Further, the existence of external programs, particularly of scripts that are interpreted dynamically, represents a potential security problem. In particular, the access and execute permissions of interpreted scripts must be carefully managed and monitored to prevent any unauthorized script from being executed that could, in turn, compromise the integrity of the data being collected if not the fundamental integrity of the server computer system itself. Consequently, known access counters provide no solution directly in full or in part to the need to account or audit URL references to external servers based on hyper-links from previously served web pages.

Brief Summary Paragraph Right (17):

This existing server based redirection function is insufficient to support external server access tracking since, in its usual form, the redirection is of the entire directory hierarchy that shares a common redirected base directory. Even in the most restricted form, the redirection is performed on a per directory reference basis. Thus, every access to the directory, independent of the particular web page or graphics image or CGI program that is the specific object of an access request is nonetheless discretely redirected without distinction. Any potential use of the existing server redirect function is therefore exceedingly constrained if not practically prohibited by the HTTP protocol defined operation of the redirect directive.

Brief Summary Paragraph Right (20):

Unfortunately, any such CGI program would embody all of the disadvantages associated with even the simplest access counter programs. Not only would problems of execution load and latency, as well as configuration, maintenance and security remain, but such an approach to providing redirection is inherently vulnerable to access spoofing. Access spoofing is a problem particular to CGI programs arising from the fact that the HTML reference to the CGI program may be issued without relation to any particular web page. Consequently, any CGI program implementing an access counter or other auditing or accounting data collecting program can produce an artificially inflated access count from repeated reference to the CGI program HTML statement outside and independent of a proper web page. Access spoofing inherently undermines the apparent if not actual integrity of any data gathered by a CGI program. Since, at minimum, the ability to insure the accuracy of even a simple access count would be of fundamental importance to an Internet service advertiser, the use of CGI programs to provide even basic accounting or auditing functions is of limited practical use. Finally, HTML does not provide a tamper-proof way for two URLs to be accessed in sequence with just one URL reference button, such as, for example, a server CGI counter URL reference followed by external server URL reference.

Brief Summary Paragraph Right (23):

Thus, an advantage of the present invention is that URL reference data is captured in an expedient manner that interposes a minimum latency in returning the ultimately referenced web page while imposing minimum visibility of the redirection protocol on client users.

Brief Summary Paragraph Right (24):

Another advantage of the present invention is that independent invocations of server external support programs and multiple external data references are not required as a consequence of the present invention, thereby minimizing the CPU and disk intensive load on the web server computer system and the resulting latency.

Brief Summary Paragraph Left (1):

The server\_name is typically "www" and the sub\_domain.top-level\_domain is a standard Internet domain reference. The path is an optional additional URL qualifier.

Brief Summary Paragraph Left (2):

Thus, a counter value incremented with each discrete execution of the CGI program

(count.cgi) dynamically provides part of the displayable image of the reconstructed web page. The time, remote client requester, client domain, client browser type and other information that may be known through the operation of the HTTP protocol may be logged as part of the CGI program's function. Consequently, a reasonable manner of accounting and auditing for certain web page accesses exists.

Drawing Description Paragraph Right (2):

FIG. 1 provides a schematic representation of client and server computer systems inter-networked through the Internet;

Detailed Description Paragraph Right (1):

A typical environment 10 utilizing the Internet for network services is shown in FIG. 1. Client computer system 12 is coupled directly or through an Internet service provider (ISP) to the Internet 14. By logical reference via a uniform resource locator, a corresponding Internet server system 16, 18 may be accessed. A generally closed hypertext transfer protocol transaction is conducted between a client browser application executing on the client system 12 and an HTTPd server application executing on the server system 16. In a preferred embodiment of the present invention, the server system 16 represents an Internet Business Service (IBS) that supports or serves web pages that embed hyper-link references to other HTTPd server systems coupled to the Internet 14 and that are at least logically external to the server system 16.

Detailed Description Paragraph Right (2):

Within this general framework, the present invention enables the tracking of the selection of embedded hyper-link references by client system 12. That is, an embedded hyper-link reference is associated with a graphical banner or other Web page element that is selectable, or clickable, by a user of the client system 12. A banner click on a client system is typically made to obtain information, identified in some fashion by the banner graphic that is of interest to the client system user. Tracking is preferably enabled by embedding HTML information in the Web page served to the client system 12. This information is served from any prearranged HTTPd server system to the client system 12. The prearrangement is with an IBS to track banner clicks, on Web pages served by or on behalf of a designated tracking HTTPd server system, such as system 16, that operates to collect the served page provided tracking information.

Detailed Description Paragraph Right (4):

The preferred embodiment of the present invention utilizes a server-side process implemented as a proprietary modification to the HTTPd server application executed by the server system 16 and that uses the HTTP redirection directive. Thus, a web page served by an HTTPd server system, such as the server system 16 or another server system (not shown) to the client 12 embeds a URL reference to a web page served by the logically external server system. Selection of this embedded URL through the client browser of the client computer system 12 results initially in an HTTP transaction with the server system 16 rather than the external server. The information stored in the embedded URL first served with the web page to client system 12 is thus provided back to the server system 16 upon selection of the URL even though the apparent target of the URL is the external server system. A redirection response is then provided by the server system 16 to the client system 12 providing the corresponding redirection URL.

Detailed Description Paragraph Right (12):

Within the redirection data, the data component "NwPg" serves as a client or account identifier. The data component "003" is a series identifier indicating a particular graphic image that was associated with the redirection URL as embedded in the web page served to the client system 12. Finally, the data component "AA" may be utilized to provide a basic validation identifier that serves to permit the HTTPd server 30 to identify inappropriate repeated submissions of the redirection URL to the server system 16 or those that are determined to be obsolete by convention.

Detailed Description Paragraph Right (14):

Each of the data terms within a redirection URL may be statically or dynamically created by the HTTPd server 30 as part of the process of originally serving a web page with the embedded redirection URL to a client computer system 12. With dynamic generation, different graphic images corresponding to a single advertiser or one of any number of advertisers may be effectively served with an otherwise statically

defined web page. The data terms of the embedded redirection URL may be dynamically selected based on the identity of the advertiser and graphics image in addition to separately establishing a hypertext link to the graphics image as part of an instance of serving a particular web page by the HTTPd server 30. Indeed, the selection of advertiser and graphics image could be made at least in part on the identity of the client computer system 12 as established through information provided by the conventional operation of the HTTP protocol, and on the client profile if known.

Detailed Description Paragraph Right (15):

The validation code may also be dynamically generated. In an alternate embodiment of the present invention, the validation code encodes a representation of the day of the year with the account and image identifier data terms to generate an identifier, preferably encoded as two digits, that provides a sufficient degree of uniqueness to allow an embedded redirection URL to be aged on a per day basis. Furthermore, the validation code remains constant on a per day basis and thereby still permits the number of references on a per day per specific client system 12 basis to be tracked by the HTTPd server 30 so as to limit the frequency that a specific instantiation of the web page is repeatedly presented to a specific client 12. Additionally, the HTTPd server 30 may operate to block operation on a received redirection URL where the corresponding web page has not recently been served to the requesting client 12.

Detailed Description Paragraph Right (19):

A preferred method 40 of processing redirection URLs provided to a server computer system 16 by a client computer system 12 is illustrated in FIG. 3. As each client request is received 42 the data provided as part of the request is examined to determine whether the request embeds the redirect key word 44. If the URL data does not specify a redirection request consistent with the present invention, the URL data is checked 46 to determine whether the URL data conventionally specifies an existent local web page. If the web page does not exist or, based on the client identification data provided via the HTTP protocol in connection with the URL client request, the particular client is not permitted access to the existent web page, the HTTPd server 30 determines a corresponding error message 48 that is returned to the client computer system 12. Otherwise, the HTTPd server 30 proceeds and serves the local web page 50 to the client computer system 12.

Detailed Description Paragraph Right (20):

Where URL data at least specifies a redirection request 52, the URL data is further checked for validity. A table of valid combinations of client and graphic image identifiers, preferably cached in memory in the server system 16, may be used to initially establish the validity of the redirection request. The validation code may either be checked by recalculation based on the provided redirection data or checked against another table of validation codes that are current. In either event, the relative timeliness of the redirection request can be determined from the age of the validation code and therefore serve as basis for determining whether the current redirection request is timely or suspect. Furthermore, additional checks may be performed to verify that the corresponding web page has indeed been served recently by the server computer system 16 to the particular requesting client computer system 12 based on a short term log of local web pages actually served by the server computer system 16. Finally, access permissions enforced by the server computer system 16 can be checked against the identification of the client computer system 12 to categorically limit redirection to defined classes of clients. Where the request is determined to be invalid for any reason, an appropriate denial message is generated and issued 48.

Detailed Description Paragraph Right (23):

The redirection capability provided by the present invention is fully consistent with existent de-facto standard redirection capabilities provided by conventional HTTPd servers. A further detailed portion 60 of the process 40 is shown in FIG. 4. Within the operation of the HTTPd server 30, the URL data 62 is received and initially parsed 64 to identify the appropriate existence of the redirect key word. Where the specific form of the redirection URL of the present invention is not identified 66, the URL is further processed in a conventional manner to determine whether any other form of redirection is applicable. In addition, an evaluation of conventional access privileges to a local web page where no conventional redirection is specified can also be performed with, ultimately, an appropriate response message being issued 68.

Detailed Description Paragraph Right (24):

In the specific instance where the URL request is of the special redirect form consistent with the present invention, as opposed to conventional HTML redirection capabilities, the URL data is processed 70 and, in combination with the HTTP protocol-provided data identifying the client computer system 12, a database record is created or updated in the persistent mass storage device 32 at 72. The second URL is then extracted 74 and a redirection message, specifically a type 302 temporary redirection message, is prepared. As before, the second URL may be a direct or literal URL or an indirect redirection target server identification that is resolvable by the HTTPd server 30 into a URL that is at least sufficient to identify the target redirection server. Since the second URL, as embedded in a Web page, is defined through prearrangement with the operation of the HTTPd server 30, resolution of any indirect redirection target server identification is fully determinable by the HTTPd server 30 through, for example, a database look-up operation.

Detailed Description Paragraph Right (26):

Other server-side operative embodiments of the present invention can use other specific protocols to transfer the tracking information from the client system 12 to the HTTPd server 30. These other HTTP protocol methods include, for example, GET, FORMS, OPTIONS, HEAD, PUT, DELETE, AND TRACE. Use of these other protocol methods are generally similar, differing in their requirements for specific browser support for the protocol methods and details of their specific HTML markup coding into Web pages.

Detailed Description Paragraph Right (27):

As an example of the use of these other protocol methods, the HTTP GET method can be implemented by embedding the following HTML code tags in the Web pages served to a client computer system.

Detailed Description Paragraph Right (30):

As another example, an HTTP POST method can be used. The Web page embedded HTML tags can be coded as follows:

Detailed Description Paragraph Right (31):

In accordance with the present invention, a client-side process can also be utilized to transparently provide notification of the selection of a Web page element by a client computer system. FIG. 5 provides a representation 78 of the data transfer flows involved in both the server-side and client-side processes that implement the present invention. Common to both server-side and client-side process implementations, a client computer system 80 issues an initial Web page request over the Internet (not shown) to a Web page server system 82. A corresponding Web page 84 including a Web page element 86 is returned to the client computer system 80.

Detailed Description Paragraph Right (32):

Again, common to both server-side and client-side process implementations of the present invention the Web page element 86 is provided through the embedding of information in the Web page 84. In the circumstance of a server-side process as generally depicted in FIG. 6, the process of the present invention following from a banner click 96 results in a client browser action. Specifically, the embedded information controls the operation of the Web browser on the client computer system sufficient to issue a notification URL 98 directed to the redirection target server system 88, as shown in FIG. 5. The server process 100 initiated in response to the notification URL receipt produces the redirection message that is returned to the client computer system 80. In connection with the generation of the redirection message, the server system 88 also logs and optionally processes the data received as part of the notification URL 98.

Detailed Description Paragraph Right (33):

Based on the redirection message, the client computer system 80 then preferably issues an HTTP request 102 based on the information contained in the redirection message. Referring again to FIG. 5, the HTTP request 102 is provided via the Internet 14 to another Web page server system 90 that responds in a conventional manner by the serving of Web page 92 to the client computer system 80 as the Web page 104 that was inferentially referenced by the Web page element 86.

Detailed Description Paragraph Right (34):

The method of the present invention utilizing a client-side process is generally shown in FIG. 7. The method 106, for the purposes of explanation here, generally begins in response to a banner click 108 to initiate a client process 110 executing in connection with the operation of the Web browser on the client computer system 80. In a preferred embodiment of the present invention, the client process 110 is provided with the Web page 84 to the client computer system 80. The client process 110 is invoked in response to the banner click and operates to first issue a notification URL message 112 and, second, to issue an HTTP request 114. Both messages are issued through the Internet 14 and to the target server system 88 and Web page server 90, respectively. The order that the client process 110 issues the notification URL 112 and HTTP request 114 is not significant. Further, acknowledgment of the receipt of the notification URL from the target server system 88 is not required prior to issuing the HTTP request 114. Indeed, as evident to the user of the client computer system 80, the only response recognized as significant is the receipt 116 of the Web page 92.

Detailed Description Paragraph Right (35):

As in the case of the server-side process, the client-side process 110 can be implemented in a number of different manners that, for purposes of the present invention, each result in the delivery of data to the target server system 88 and a URL request to a Web page server system 90 to provide a Web page 92 having a prearranged correspondence with the Web page element 86. Specifically, the client-side process can be directly coded into the browser application or supplied as a browser plug-in to a conventional browser application. The client-side process can also be implemented through use of Java and JavaScript type applets.

Detailed Description Paragraph Right (36):

An exemplary client-side process is implemented through the use of a Java Applet. The HTML code that is embedded in the Web page 84, for purposes of this example, is as follows:

Detailed Description Paragraph Right (40):

Finally, the above applet can be referenced for execution by embedding the following HTML code into the Web page 84.

Detailed Description Paragraph Left (1):

This HTML code defines "MTCH1073.gif" as the Web page banner graphic, "www.infoseek.com" as the direct URL, "MTCH-2009-1073-GEN" as the data, and "www.match.com" as the target redirection server.

Detailed Description Paragraph Type 1 (4):

Content-type: application/x-www-form-urlencoded

Other Reference Publication (10):

"Broadvision: Personalized Marketing and Selling on the Internet Unleashed by BroadVision; One-to-One Application System Helps marketers Build Long-term Relationships Through Personalized content, Services and Promotions", Jan. 22, 1996, Byline: Business Editors/Computer Writers; Dateline: Los Altos, Calif.

Other Reference Publication (11):

"WebTrends Windows 3.1 application will chart World Wide Web site statistics", InfoWorld; Framingham; Jan. 8, 1996; Wingfield, Nick.

Other Reference Publication (14):

"Characterizing browsing strategies in the World-Wide Web", Computer Networks and ISDN Systems; Amsterdam; Apr. 1995; Catledge, Lara D; Pitkow, James E.

CLAIMS:

6. A method of tracking the occurrences of Web page banner click-through references by users of client computer systems to corresponding Web pages where such occurrences are tracked by a tracking computer system transparently with respect to the client computer system users, said method comprising the steps of:

a) enabling a Web page element to be provided to a predetermined client computer

system such that said Web page element is selectable by the user of said predetermined client computer system and wherein said Web page element is identified with a content provider computer system; and

b) providing for predetermined tracking information to be provided to said predetermined client computer system with said Web page element so as to be maintained by said client computer system in relation to said Web page element such that, in response to selection of said Web page element by the user of said predetermined client computer system, said predetermined tracking information is used automatically by said client computer system to provide tracking data to said tracking computer system and to separately provide a content request to said content provider computer system.

7. The method of claim 6 wherein said Web page element identifies obtainable content to the user of said predetermined client computer system and wherein said content request is maintained with said predetermined tracking information by said predetermined client computer system.

8. The method of claim 7 wherein selection of said Web page element provides for initiation of a client-side process that submits said predetermined tracking information to said tracking computer system and said content request to said content provider computer system.

11. The method of claim 10 wherein said predetermined client computer system executes a browser application to receive and process said Web page element and wherein said client-side process is performed by execution of a control script by said browser application.

12. The method of claim 10 wherein said predetermined client computer system executes a browser application to receive and process said Web page element and wherein said client-side process is performed by execution of a plug-in control program coupled into said browser application.

13. The method of claim 10 wherein said predetermined client computer system executes a browser application to receive and process said Web page element and wherein said client-side process is performed by an application program executed by said predetermined client computer system under the control of said browser application.

14. A method of tracking the click-through selections of advertising banners provided on Web pages provided by Web page server computer systems to client computer systems, said method comprising the steps of:

a) providing for a Web page including a predetermined page element to be served into a browser application executed by a client computer system, said Web page including predetermined encoded accounting data and an identification of a Web page server computer system that is stored by said client computer system in connection with said predetermined page element;

b) providing for the execution of a client-side process in connection with said browser application upon selection of said predetermined page element by a user of said client computer system, said client-side process providing for the transfer of said encoded accounting data to an auditing computer system and separately providing for the issuance of a predetermined Web page request to said Web page server system consistent with said identification.



WEST

☐ Generate Collection 

L7: Entry 169 of 382

File: USPT

Sep 12, 2000

DOCUMENT-IDENTIFIER: US 6119101 A  
TITLE: Intelligent agents for electronic commerce

Abstract Paragraph Left (1):

A system for electronic commerce (10) having personal agents (12 and 13) that represent consumers and providers in a virtual marketplace (28). Consumer personal agents conceal the identity of the consumer and are capable of creating decision agents (14) that shop for products and assist consumers in comparing and ranking products. Provider personal agents are capable of creating demand agents (16) that quantify demand and target specific consumers without learning the identity of the consumers. Based on data generated by the activities of the decision agents and on preference data maintained by consumer personal agents, provider personal agents can quantify current, historical, and future demand, simulate demand, and target specific consumers for advertising and other messages. Provider personal agents can cooperate with consumer personal agents to collect data about reasons for sales and lost sales and to offer consideration payments to consumers. Consumer personal agents can automatically reject unsolicited messages that do not satisfy the consumer's preferences.

Brief Summary Paragraph Right (12):

A consumer usually receives no direct benefit for inspecting a provider's advertisements, except for the information itself if the advertisement is relevant. Occasionally, providers and marketing research firms give consumers a small fee or gift in return for participating in a survey. This is called "paying a consideration." However, there are few opportunities for consumers to receive considerations, and no way for consumers to seek out providers that are willing to pay considerations.

Brief Summary Paragraph Right (14):

The unexpected and explosive growth and popularity of the Internet in recent years has opened a new avenue for commerce--"electronic commerce". Electronic mail ("e-mail"), the delivery of messages via electronic communication networks, has become a major notification mechanism, especially for point-to-point communications. Numerous "bulletin board" systems and the USENET newsgroup distribution network are popular broadcast notification systems. But it is the advent of the World Wide Web, frequently referred to as "the Web", that has excited the imagination of thousands of consumers, providers, and entrepreneurs. The Web conveniently delivers text, images, and audio clips to individual users. In fact, the Web can be used to distribute any sort of information that can be represented in a computer data file.

Brief Summary Paragraph Right (15):

The popularity of the Web has encouraged the establishment of many Internet Access Providers (IAPs), who provide communication access to the Internet for individuals and organizations; and Internet Service Providers (ISPs), who provide various services via the Internet, such as e-mail delivery, Web site hosting, search engines, and "chat" areas. This communications and information infrastructure continues to grow at a prodigious rate. With so many individuals and organizations now having convenient and inexpensive communications access, the Internet offers a promising base for a new mode of commerce.

Brief Summary Paragraph Right (16):

Electronic commerce addresses many of the disadvantages of traditional commerce. It is convenient and inexpensive to prepare and deliver e-mail to specific persons or groups of persons. Many computer systems are repositories for immense databases that are

useful for commerce, and the global communication network provides a means for accessing that data. Personal computer systems and specialized software are now enabling consumers to view online product catalogs and other information that providers publish on the Web. A multitude of researchers and organizations are working out the details of payment mechanisms to allow secure monetary transactions across the Internet.

Brief Summary Paragraph Right (17):

Even with the colossal potential of the Internet, there are still a number of problems to be solved to support the establishment of a viable virtual marketplace, especially regarding the collection and exchange of market information. The electronic form of commerce doesn't address all of the problems of traditional commerce, and it raises a number of new difficulties.

Brief Summary Paragraph Right (22):

A software agent is a software entity that is capable of performing certain delegated electronic actions (including holding information) on behalf of a user or another agent. An IBM white paper, "The Role of Intelligent Agents in the Information Infrastructure" (Gilbert, et. al., IBM Corporation, undated; also published on the Web at URL <http://www.networking.ibm.com/iag/iagptc2.html>; also hyperlinked from <http://www.raleigh.ibm.com/iag/iaghome.html>) describes three dimensions along which intelligent agents may be measured: agency, intelligence, and

Brief Summary Paragraph Right (25):

A wandering agent is a software entity that resides within a single computer system and "visits" or communicates with other computer systems, frequently via the Internet. Wandering agents are being used successfully to map the Web, gathering the data that is used in the internal indexes of search engines. However, these agents are very slow in operation, especially when there are thousands of sites to visit, and some wandering agents may be blocked from accessing some sites (as the BargainFinder agent has been). As described in "Internet Agents: Spiders, Wanderers, Brokers, and 'Bots" (Cheong, Fah-Chun, New Riders Publishing, 1996), wandering agents are also used for various Web maintenance tasks and for Web mirroring. Cheong lists and describes many instances of wandering agents. The following list of wandering agents was compiled on Dec. 26, 1995 from Appendix G of Cheong. The purpose of each agent is excerpted by the inventor from short descriptions in Cheong.

Brief Summary Paragraph Type 1 (8):

It is expensive to target advertisements to specific customers. As mentioned above, mailing lists frequently contain a high percentage of names of uninterested customers, yet buying or renting mailing lists is costly. Controlled circulation magazines, where potential subscribers complete a qualification form to receive a (usually complimentary) subscription, don't always yield truly qualified names, since there typically is no mechanism to verify the information that the potential subscribers report.

Brief Summary Paragraph Type 1 (22):

Most search engines (Web sites that implement a capability for searching a database of information) are generic. They use general words as search keys, whereas consumers would benefit from information that is categorized by brands, product names, product category, store names, etc. Even though search engines are much faster than physical store visits, the search process is still tedious and prone to error.

Brief Summary Paragraph Type 1 (23):

Using search engines for comparative shopping is very slow. Search engines return pointers to information sites, not the actual information. Search engines frequently return thousands of "hits", or items that partially match the search request. Consumers must sift through these hits, determine which ones are likely to be truly of interest, and contact the individual Web sites to collect the product information.

Brief Summary Paragraph Type 1 (24):

Consumers find comparative shopping tedious because every Web site has its own format for information. It is difficult to automate comparative shopping because of the inconsistent and non-standardized data formats.

Brief Summary Paragraph Type 1 (27):

Consumer searching is not private. The search engine can collect data about who is searching and the keywords of their search. Many Web sites maintain "cookies" or "passports", that is, files that contain information about the consumer who is searching. In effect, the consumer's searching and decision making is exposed to public view.

Brief Summary Paragraph Type 1 (28):

Dealing directly with the provider exposes the consumer's identify and other data to the provider. When the consumer orders or purchases a product from a provider's Web site, the consumer must reveal name, delivery address, credit card data, etc. Even if the consumer is merely inspecting the information available on a Web site, the site's owner can still collect data about the consumer from the consumer's browser software.

Brief Summary Paragraph Type 1 (30):

Once a search engine successfully delivers a promising Web address (known as a "URL" for Uniform Resource Locator), the consumer may be disappointed to find that the URL is no longer valid. Thousands of Web pages are published and withdrawn daily, and the search engines are not always informed of the changes. Web pages customarily contain references to other Web pages ("links"), and a link is not always updated when the target URL changes, especially if the target URL names a page that is published by another entity. These "broken URLs" refer to Web pages that no longer exist or have moved to another address, so the consumer can no longer reach the information.

Brief Summary Paragraph Type 1 (31):

The style of presentation is still controlled by the provider. The consumer has no useful mechanism to request, for example, only summary information about products. The avenue of presentation is also fixed. If the data is available on the Web, it must be accessed via the Web; the consumer typically cannot arrange to have the data delivered, for example, via pager, facsimile, or cell phone display.

Brief Summary Paragraph Type 1 (34):

Many providers are reluctant to advertise on the Internet because of software agents that make recommendations based on price alone. For example, the BargainFinder service, a research project of Andersen Consulting, that gathers pricing data on audio compact disks has been blocked from many providers' Web sites. Without the opportunity to present other features that justify a higher price, higher-priced providers would lose sales or be forced to lower their prices (and erode their retail margins).

Brief Summary Paragraph Type 1 (35):

Consumers may not be aware of a provider's Web site. A provider typically advertises the existence of a Web site via traditional means, driving up the cost of maintaining a Web presence.

Brief Summary Paragraph Type 1 (36):

Very few tools have emerged to help providers judge the effectiveness of their Web sites. For example, providers cannot gather enough information to calculate market share, since the statistics associated with competitor's Web sites are not publicly available.

Brief Summary Paragraph Type 1 (41):

Many Web sites now have the capability to generate Web pages ("content") on the fly, but it is difficult for the Web server to obtain enough data about the requestor to personalize the content in a useful way.

Brief Summary Paragraph Type 1 (42):

"Banner" advertisements placed on popular Web sites have not been particularly successful. Many online users don't "click-through" the banner to the more extensive advertiser information, because the placement of such banners is not finely targeted. Some Web activity statistics indicate that only one and one-half to three and one-half percent of users click-through.

Brief Summary Paragraph Table (1):

	Name Purpose
	ASpider (Associative Spider) searches for

keywords Arachnophilia collect documents Aretha (none given) CS-HKUST WWW Index Server Resource Discovery, Validate HTML ChURL URL checking Checkbot (none given) EIT Link Verifier Robot verify links Emacs W3 Search Engine Resource Discovery Fish Search Resource Discovery GetURL validate links, mirroring HTML Analyzer check validity of Web servers HTMLgobble mirroring Harvest Resource InfoSeek Robot collect information for database JumpStation Robot Resource Discovery Katipo look for changed documents Lycos information retrieval and discovery MOMspider maintenance of distributed hypertext Mac WWWorm keyword searching NHSE Web Forager Resource Discovery NIKOS Resource Discovery NorthStar Robot textual analysis, indexing Open Text Corporation Robot (none given) Peregrinator indexing Python Robot (none given) RBSE Spider Resource Discovery SG-Scout Resource Discovery Scooter Resource Discovery Spry Wizard Robot Resource Discovery TITAL Resource Discovery Tarspider mirroring Tcl W3 Robot validate links TkWWW Robot find logically related pages W4 (World Wide Web Wanderer) measure growth in Web WM32 Robot Resource Discovery, validate links WWW - World Wide Web Worm indexing WebCopy mirroring WebCrawler Resource Discovery WebLinker traverses Web converting URN.fwdarw.URL WebWatch validate HTML Webfoot Robot (none given) Weblayers validate, cache, maintain links Websnarf mirroring Webwalk Resource Discovery, validate links, mirroring \_\_\_\_\_

Drawing Description Paragraph Right (43):

FIG. 39 is a schematic representation of a Web page used to "login" to a agent system.

Drawing Description Paragraph Right (44):

FIG. 40 is a schematic representation of an example Web page used to specify search criteria when composing a Decision query in an example consumer electronics Market.

Drawing Description Paragraph Right (45):

FIG. 41 is a schematic representation of an example Web page used to specify search criteria when composing a Decision query in an example automobile Market.

Drawing Description Paragraph Right (46):

FIG. 42 is a schematic representation of an example Web page used when composing an advertisement for a television set.

Detailed Description Paragraph Right (3):

Consumers and providers both may place sell and buy advertisements (ads) in the marketplace. Providers can target groups of consumers to receive special messages such as special offer ads.

Detailed Description Paragraph Right (12):

Agent System 10 contains different Markets 18 for various categories of products and services. The various kinds of agents and the markets are software components. These components are more fully described in conjunction with other figures. In a preferred embodiment, the software components utilize but are not limited to conventional object-oriented technology, distributed object-oriented technology, object-oriented database technology, relational database technology, general Internet communication technology, World Wide Web (WWW or Web) technology, and electronic mail (e-mail) technology.

Detailed Description Paragraph Right (15):

Each User of Agent System 10 has a means of communicating with the system, as indicated by Communication Device 22 or 23 of each User 20 or 21 respectively, and may have multiple means and devices. These communication devices can be any device capable of communicating over the Internet (such as personal computers with Web browser and/or e-mail software), other devices capable of operating with computer control (such as facsimile machines and pagers), and other means of transferring data and commands between the User and the Agent System. A User may also store data on various devices outside Agent System 10, as indicated by Provider Remote Data 25 and Consumer Remote Data 24, provided that such data can be accessed by the system via (at least one of ) the User's Communication Device(s). In this context, "remote" means located outside the direct control of Agent System 10.

Detailed Description Paragraph Right (34):

A Preference Manager function 54 maintains data about the preferences of the user.

Preferences indicate items of interest to the user, such as favorite brands, interest in sports, etc. Within Agent System 10, preference data also includes "demographic" data. Demographic data indicates facts about the user, such as whether the user is a homeowner, the user's gender, the user's age group, etc. Although marketing industry usage of the term "demographics" may include a person's name, address, or other identifying data, a Preference Manager's demographic data does not include data that identifies the particular user. Preference data may be entered manually by the user using, for example, a form on a Web page, or data may be loaded by a System Administrator. Preferences may also be updated automatically by the system as, for example, when the user instructs the system to "remember" a product brand name from a product search. Preference Manager 54 uses preference data to order search results, so that items that are more likely to be preferred by the user will be displayed first when the results are delivered to the user. Referring now to FIG. 5A, each preference datum 68 comprises not only a value 72, but also a key 70 for ease of searching. Referring to FIG. 5B, a small sample of preference data illustrates the kind of data that might be used. A particular user typically will have much more preference data. Some values are shown as "rank m in n" to illustrate that ranking data may also be stored. The specific keys of any particular set of preference data depends on what the user has entered, etc. Only keys that are relevant to a particular user are included in that user's preferences, and the specific data maintained will change over time.

Detailed Description Paragraph Right (61):

A Demand Agent 16 acts on behalf of a provider user, as instructed by the provider's Personal Agent 13, to search out and collect information from the Agent System 10 that helps the provider quantify consumer demand and helps target specialized advertisements to a group of consumers. A provider may have multiple Demand Agents 16 active within Agent System 10 at any time. For example, a provider may have one Demand Agent 16 calculating historical demand over the past month for a certain model of sports shoe, and have another Demand Agent 16 searching for consumers who have purchased sports shoes in the past month to receive ads for sports socks.

Detailed Description Paragraph Right (111):

Some Figures illustrate example screen layout for input and output using a Web browser interface. Underlined text represents hyperlinks.

Detailed Description Paragraph Right (114):

Referring to FIG. 11, an overall method according to the present invention for searching for a product is referred to generally by reference numeral 220. When a user acting as a consumer decides to search within Agent System 10 for a product or product category, the consumer establishes a communications session with consumer's Personal Agent 12 (steps 222-224). Typically the consumer, using a personal computer, connects to consumer's Internet access provider, directs consumer's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen is illustrated in FIG. 39.

Detailed Description Paragraph Right (118):

At this point Decision Composer 74 arranges to format and display the Product Template and the instructions (step 266). The consumer, following the instructions, completes the search criteria in the Product Template (step 268). When the consumer's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. as illustrated in the sample screens of FIG. 40 (searching for consumer electronics) and FIG. 41 (searching for automobiles).

Detailed Description Paragraph Right (119):

Referring to FIG. 12B, if the consumer wishes to perform an extended search, that is, a search that will continue for a period of time, the consumer enters a period of time for the search to continue (step 272). The extended search continues even when the consumer is not "on-line", that is, even when the consumer is not participating in a communication session with the Agent System. Search results are collected, as described below, for later delivery to the consumer. Alternatively, the consumer may instead choose an immediate search, that is, a search that will return results as soon as possible (step 274). The consumer need not be on-line to receive results from an immediate search; the results may be delivered later. The consumer may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g.,

6:00 p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 276-280). At this point the Decision Query composition is complete (step 282).

Detailed Description Paragraph Right (122):

Referring back to FIG. 11, Decision Agent 14 is now ready to perform the search for a product according to the consumer's criteria, so it invokes a Perform Decision Search subroutine (step 236). Referring to FIG. 15, a Perform Decision Search subroutine is referred to generally by reference numeral 236. Decision Agent 14 performs an immediate search by invoking a Perform Immediate Search subroutine (step 308). Even if an extended search is chosen by the consumer, an immediate search is done first to get initial results. Because the data to be searched resides within Agent System 10 or is easily and directly accessible to Agent System 10, the search process can be faster than a search that employs agents which visit multiple Web sites or databases over the Internet.

Detailed Description Paragraph Right (127):

Referring now to FIG. 19, a Deliver Search Results subroutine is referred to generally by reference numeral 360. Immediate search results are delivered to the consumer when the consumer's desired delivery time is reached (which may be immediately if the consumer has so requested). Intermediate results from extended searched are delivered periodically according to the consumer's desired delivery period. When the desired delivery time is reached (step 362), Preference Manager 54 organizes the not-yet-delivered results according to the consumer's preferences (step 364). For example, results that mention favored brands are ordered before results with less favored brands. Delivery Manager 56 formats the responses according to the consumer's desired delivery media (step 366). For example, if the consumer's desired delivery media is the Web, a Web page in HTML is generated. For another example, if the consumer desires e-mail delivery, a suitable representation is generated. When formatting is complete, Delivery Manager 56 arranges the actual delivery of the search results (step 368). If the Decision Agent has completed its search, no more results will be forthcoming, so a subroutine Expire Decision Agent expires the Decision Agent (steps 370-372).

Detailed Description Paragraph Right (130):

Referring to FIG. 21, an overall method according to the present invention for quantifying demand is referred to generally by reference numeral 386. When a user acting as a provider decides to quantify demand (perform a demand search) within Agent System 10 for a product or product category, the provider establishes a communication session with provider's Personal Agent 13 (steps 388-390). Typically the provider, using a personal computer, connects to provider's Internet access provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in FIG. 39.

Detailed Description Paragraph Right (134):

At this point Demand Composer 82 arranges to format and display the Product Template and the instructions (step 432). The provider, following the instructions, completes the search criteria in the Product Template (step 434). When the provider's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. For example, the provider might use screens similar to the sample consumer screens previously illustrated in FIGS. 40 and 41.

Detailed Description Paragraph Right (135):

Referring to FIG. 22B, the provider selects the type of demand to quantify (step 436). If the provider chooses to quantify current demand, Demand Composer fills in the datetime range to indicate that only currently active Decision Agents should be searched (steps 438-440). If the provider chooses to quantify historical demand, the provider selects a datetime range (steps 442-444) to indicate that only Decision Agents that were active during that datetime range should be searched. The provider may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g., 6:00 p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 446-450). At this point the Demand Query composition is complete (step 452).

Detailed Description Paragraph Right (142):

The search has now ended. It remains for Demand Agent 16 to deliver the demand search results to the provider. Referring to FIG. 28, a Deliver Demand Results subroutine is referred to generally by reference numeral 512. When the desired delivery time is reached (step 514), Preference Manager 54 organizes the not-yet-delivered results according to the provider's preferences (step 516). For example, the provider may prefer to see only numeric totals, or the provider may prefer to see a detailed listing of all the Decision Agent queries that satisfied the demand search. Delivery Manager 56 formats the responses according to the provider's desired delivery media (step 518). For example, if the provider's desired delivery media is the Web, a Web page in HTML is generated. If the provider desires e-mail delivery, a suitable representation is generated. When formatting is complete, Delivery Manager 56 arranges the actual delivery of the search results (step 520). The Demand Agent has completed its task, so it can be expired (step 522).

Detailed Description Paragraph Right (144):

Both providers and consumers may place ads in Agent System 10. An advertisement may be an offer to sell or an offer to buy. A placed advertisement becomes effective at a particular time and expires at a particular time, and searching Decision Agents consider an advertisement only during the ad's effective time. Even after ads expire, they may be accessed for historical reasons. Users may place ads manually, or they may cause ads to be loaded from or referenced from remote systems via a remote database adapter. Referring to FIG. 30, an overall method according to the present invention for placing a sell or buy advertisement is referred to generally by reference numeral 534. When a provider (a user acting in the role of a provider) desires to place an advertisement manually within Agent System 10 for a product, the provider establishes a communication session with provider's Personal Agent 13 (steps 536-538). Typically the provider, using a personal computer, connects to provider's Internet access provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in FIG. 39.

Detailed Description Paragraph Right (148):

Ad Composer 90 arranges to format and display the Product Template and the instructions (step 578). The provider, following the instructions, selects and enters values describing the product in the Product Template (step 580), adding additional description if desired. When the provider's interface is a Web browser, the Product Template is typically displayed as a combination of fill-in fields, selection lists, radio buttons, etc. as illustrated in the sample screen of FIG. 42.

Detailed Description Paragraph Right (149):

Referring again to FIG. 31B, the provider enters the price for the product (step 582). Generally, a sell advertisement will contain a specific price for the product, while a buy advertisement will contain a price range. The provider specifies the datetime that the advertisement should become effective and the datetime that the advertisement should expire (step 584). This allows providers to compose batches of ads ahead of time, for example with lower prices during a sale, and arrange for the ads to become effective when the sale starts. For receiving responses to the ad, the provider may select a delivery media (e-mail, Web page display, etc.) and a delivery time and period (e.g., immediately, 6:00 p.m. daily, Monday noon weekly, etc.), or default media and time is noted (steps 586-590). At this point the advertisement composition is complete (step 592), and Ad Composer 90 can create the actual advertisement with a Create Ad subroutine (step 594).

Detailed Description Paragraph Right (156):

To "target" a message is to select message recipients according to certain criteria intended to yield recipients that are interested in receiving the information, as opposed to delivering the message to a wider audience where fewer recipients are truly interested in the information. Within Agent System 10, targeting consumers is a process of targeting Personal Agents 12 that represent consumers that satisfy the desired criteria. Providers use the targeting process, for example, to send ads to consumers that have previously searched in a particular Market 18 or for a particular product. Providers may also use targeting to offer a product at a different price to a different groups of consumers. Providers might also send market surveys, brand name awareness notices, etc.

Detailed Description Paragraph Right (159):

Referring to FIG. 35, an overall method according to the present invention for targeting consumers is referred to generally by reference numeral 638. When a provider (a user acting in the role of a provider) desires to target a message to a select group of consumers, the provider establishes a communication session with provider's Personal Agent 13 (steps 640-642). Typically the provider, using a personal computer, connects to provider's Internet access provider, directs provider's Web browser software to Agent System's electronic address (known as a URL), and enters a login name and password. A sample login screen has already been illustrated in FIG. 39.

Other Reference Publication (2):

Streams Online Media Development, "Streams Readies Release of Breakthrough Internet Media Planning and Assessment", [http://streams.com/press .sub.-- release.html](http://streams.com/press.sub.--release.html), pp. 1-2, Aug. 31, 1995.

Other Reference Publication (4):

Chaum, D. "Achieving Electronic Privacy", Scientific American, Aug. 1992, pp. 96-101, copy supplied printed from world wide web site "<http://digicash.support.nl/publish/sciam.html>" on Apr. 3, 1997 (8 pages).

Other Reference Publication (5):

Chaum, D. "Security Without Identification: Card Computers to make Big Brother Obsolete", Communications of the ACM, vol. 28, pp. 1030-1044, Oct. 1985, copy supplied printed from world wide web site "<http://digicash.support.nl/publish/bigbro.html>" on Apr. 3, 1997 (24 pages).